

WHAT IS CLAIMED IS:

Sub
A2

1. An engine starting apparatus comprising:
a driven gear connected to an engine;
a starter motor adapted to be driven to rotate when said engine is started;

a speed-reduction and power-cut-off mechanism connected to said starter motor and having a rotatable output shaft, said speed-reduction and power-cut-off mechanism being adapted to output a rotation of said starter motor from said output shaft while reducing the rotational speed of the starter motor and to cut off power transmission between said starter motor and said output shaft when the rotational speed of said output shaft exceeds the reduced rotational speed of the starter motor;

a drive gear provided on said output shaft in such a manner as to be rotatable together with said output shaft and to move axially over said output shaft between an engagement position where said drive gear is brought into mesh engagement with said driven gear and a disengagement position where said drive gear is brought out of engagement with said driven gear; and

a driving unit driving said drive gear to said engagement position when said engine is started and to said disengagement position after said engine has been started.

2. The engine starting apparatus according to claim 1, wherein said speed-reduction and power-cut-off mechanism is

constituted by a wedge roller type speed reduction mechanism.

3. The engine starting apparatus according to claim 2, wherein said wedge roller type speed reduction mechanism including a plurality of rollers rotatably disposed around a rotational shaft of the starter motor; and an rotatable output shaft having an outer ring disposed around said plurality of rollers, said rotational shaft being offset from a rotational center of said outer ring, one of said wedge rollers being movable between said rotational shaft and said outer ring so as to provide a wedge action for power transmission between said starter motor and said output shaft.

4. The engine starting apparatus according to claim 3, wherein said plurality of rollers are brought into abutment with said rotational shaft and said output ring via an oil film being interposed therebetween.

5. An engine starting apparatus comprising:
a driven gear connected to an engine;
a starter motor having a rotational shaft being driven to rotate when said engine is started;

a speed-reduction and power-cut-off mechanism having a plurality of rollers rotatably disposed around the rotational shaft of the starter motor; and an rotatable output shaft having

an outer ring disposed around said plurality of rollers, said rotational shaft being offset from a rotational center of said outer ring, one of said wedge rollers being movable between the rotational shaft and said outer ring so as to provide a wedge action for power transmission between said starter motor and said output shaft;

a drive gear provided on said output shaft in such a manner as to be rotatable together with said output shaft and to move axially over said output shaft between an engagement position where said drive gear is brought into mesh engagement with said driven gear and a disengagement position where said drive gear is brought out of engagement with said driven gear; and

a driving unit driving said drive gear to said engagement position when said engine is started and to said disengagement position after said engine has been started.

6. The engine starting apparatus according to claim 5, wherein said plurality of rollers are brought into abutment with said rotational shaft and said output ring via an oil film being interposed therebetween.